

CIPHER-510
PROGRAMMABLE TERMINAL
TIME AND ATTENDANCE SYSTEM
USER'S MANUAL

V1.0

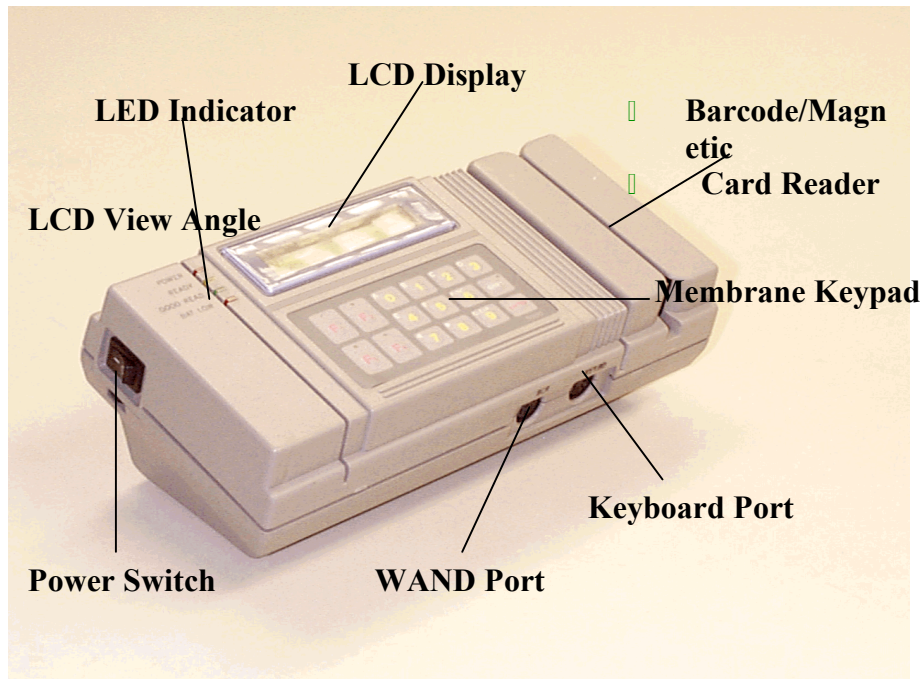
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CipherLab Co. Ltd.

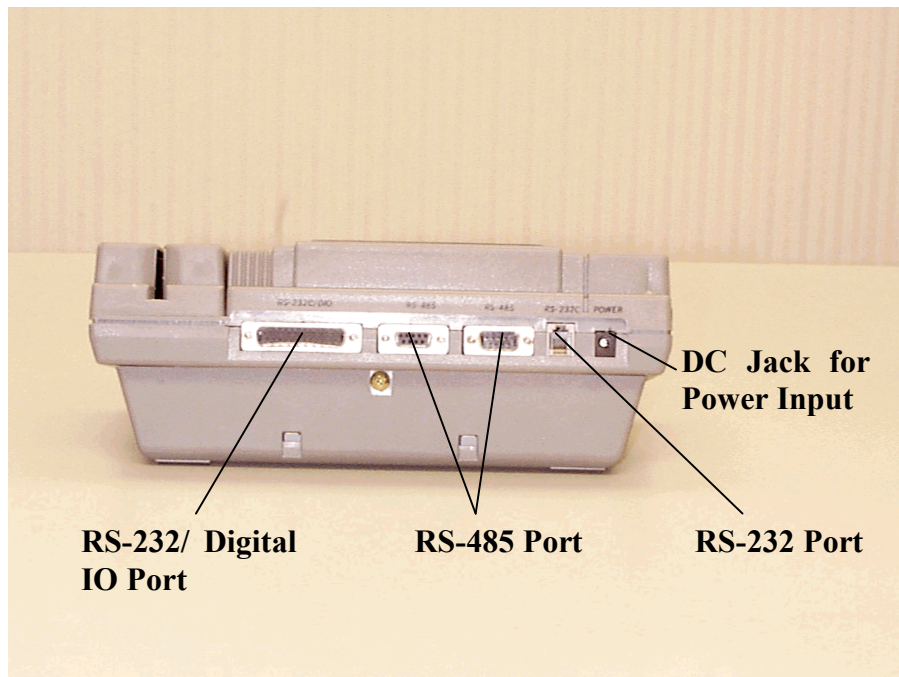
Care has been taken to ensure that the information included in this manual is complete and accurate. However, CipherLab reserves the right to change any specification at any time without prior notice

Nomenclature

510 Front View



510 Rear View



Nomenclature

510 Battery Pack Holder

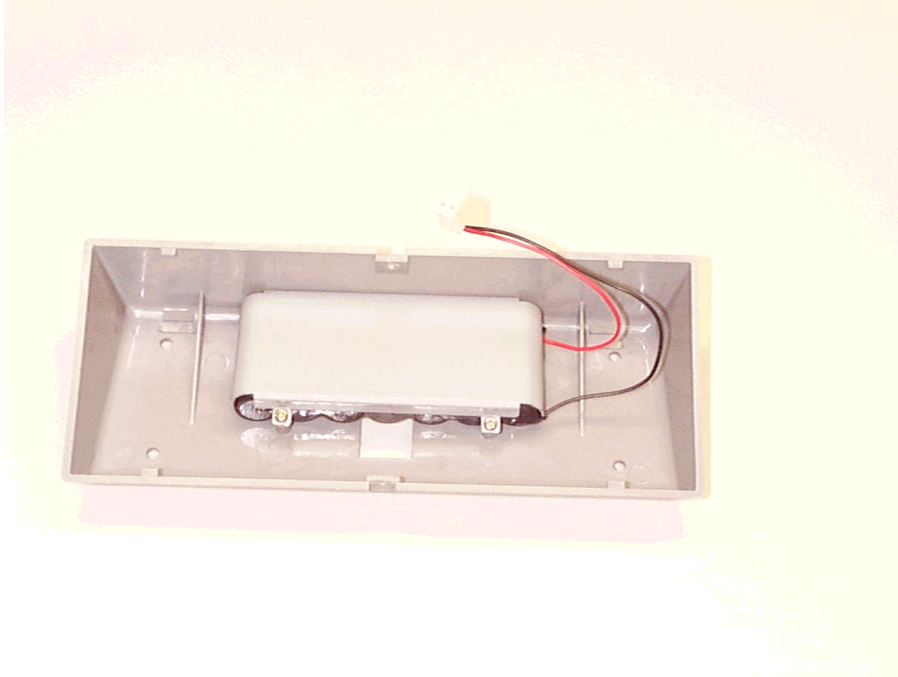


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1. Features of Cipher-510

The CIPHER-510 Programmable Terminal offers outstanding features in a compact and rugged housing suitable for industrial applications. It can be used alone or networked for up to 32 stations and is an ideal solution for companies of all sizes. It can be programmed in “C” or “Basic”. With its versatile programmable features, it can be easily configured to accommodate most application needs. Features of the Cipher-510 are listed below.

- TLCS-900 16 bit CPU running at 9.8304 Mhz
- Program : 128 KB flash memory
- Data memory : 128 KB to 512 KB SRAM (on an 128 KB base)(up to 1MB)
- Fine-tunable calendar chip
- Memory & calendar chip backup 3.6V NiCd battery
- 1.2V X 7, 1500mAh rechargeable NiCd battery for operation backup
- Battery/external DC voltage monitor circuit on-board
- Self-shutdown circuit on-board
- slot-type bar code input ports
- 2 reader ports for barcode scanners (Wand or Laser-emulation), or up to dual-track magnetic card readers
- 20 characters by 2 lines LCD display with adjustable backlight and viewing angle
- standard 4 by 4 matrix membrane keypad (expandable up to 8 by 8)
- 2 photo-isolated digital input
- 2 photo-isolated digital output
- external keyboard port (AT keyboard)
- RS232 port X 2
- RS485 port

2. The Resided Time And Attendance System

The CIPHER-510 Programmable Terminal is flexible for versatile applications. Especially, the CIPHER-510 is a highly efficient yet cost effective tool for employee time and attendance control. Users can easily create their own program and download this program to the Cipher-510 as they wish. But for users' convenience, CipherLab has developed the Time and Attendance system which is resided in the Cipher-510. Following describes the operations of the resided system which version control is V.1.4.

2.1. System Integration

A Cipher-510 system can be configured as a **standalone system** or a **multi-station system**. If only one Cipher-510 is needed, it should be configured as stand alone system. If multiple 510s in a network are desired, the multi-station configuration should be used.

2.1.1. Stand Alone System

The **line connection setting** should be set to **single**. The Cipher-510 is directly connected to the host computer through the RS232 port located on the rear panel of Cipher-510 (phone-jack connector). Since there is only one Cipher-510 in the system, the RS485 communication port is disabled.

2.1.2. Multi-station System

In multi-station system, all 510s are connected to the RS485 communication line, and only one of the Cipher-510 is connected to the host computer. The Cipher-510 which is connected to the host computer is the **master station** of the Cipher-510 network and the rest of the 510s are **slave stations**. All the 510s connected on the same RS485 network should have different **station IDs** assigned or it will corrupt the RS485 communication. Please refer to the section **Station ID** for more detail description.

1. Master Station

The master station is the manager of the RS485 communication. It schedules and handles all the RS485 communication tasks and performs like a gateway between host computer and all the Cipher-510 stations. Also the transaction data of the ID entry made on slave 510s are sent immediately to the master station which is waiting for the host computer to fetch. So it is more appropriate that the master station should have a larger memory capacity than slave stations. A large memory on the slave station would be less meaningful.

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In case the memory full condition occurred on the master station, the master station can not accept ID entries anymore and a warning is given (showing **MEMORY FULL** message on the LCD display) when ID entries are made on the master station. But for the slave stations, ID entries will be accepted and stored in their own memory. The slave stations will automatically send the stored data to the master station when there is available free memory on the master station.

The **line connection setting** of the master station should be set to **master**. The RS232 connection to the host computer should be made to the phone-jack connector located on the rear panel of 510, and the RS485 connection to the slave station should be made to the male (or female) DB9 connector located on the rear panel of Cipher-510.

2. Slave Station

The **line connection setting** should be set to **slave**. The RS485 bus line from previous Cipher-510 should connect to the male (or female) DB9 connector located on the rear panel of 510, and the RS485 bus line to the next slave station should connect to the female (or male) DB9 connector.

2.2. Working Shift

For time & attendance applications, besides the employee number and registration time, the working shift type (which is used to indicate the cause of attendance / leave) also has to be recorded. Basically Cipher-510 provides 4 shift types as shown on the keyboard (F1 to F4), and can be extended to 40 shift types with the aid of Prefix Code feature which will be described later. The LED beside the F1 to F4 keys will be lit to indicate which is the active (registered) shift type. It is the responsibility of employees to select the desired shift type before scanning the ID card.

2.2.1. Automatic Shift Change

Instead of manual alteration (troublesome tender) of the shift type, the Cipher-510 can alter the shift type automatically (hands free) according to the timetable programmed into Cipher-510. The timetable consists of 16 entries of time period (hour & minute) with the desired shift type. The filling of the entries of the timetable can be in any order, and the Cipher-510 will constantly scan all the 16 entries to see if there is a match in the time period and update the working status of shift type. To eliminate (cancel) a pre-programmed timetable entry, simply changes its shift type to 0, the Cipher-510 will ignore this entry. The following is an example of the timetable setting.

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Entry No.	Time Period	Shift Type
1	0830-1630	1
3	0030-0830	3
5	1630-0030	2
others	don't care	0

In cases where the employee wants to alter the working shift number, he/she can simply press the desired function keys (F1-F4) on the membrane keypad. The Cipher-510 will store the new shift number instead of the original one. After current entry is done, the Cipher-510 will restore the shift number according to the time- table. Note that if the employee fails to scan his/her ID cards within 5 seconds after the shift type is changed, the shift number will be restored according to the time- table defined. This is necessary to assure correctness of following entries.

2.2.2. Prefix Code

In cases that four shift types are not sufficient for the specific application, an auxiliary prefix code (1-digit from 0 to 9) can be utilized to further extend the overall shift types to 40. Prior to scan the ID card, the employee can press one of the digits (from 0 to 9) of the membrane keypad, and the Cipher-510 will store the shift type and this prefixed digit. Once this function was enabled and the employee forgot to press this prefix code, the Cipher-510 will discard this entry, give a warning and ask the employee to try again.

2.3. ID Entries

The employee ID can be input to the Cipher-510 by either scanning barcodes or magnetic cards. This depends on which input device is installed on Cipher-510. However, the ID input via membrane keypad is also allowed only when this feature is enabled.

2.3.1. Bar Code

There are 2 bar code input ports supported on the Cipher-510. Besides the built-in slot type device, an auxiliary bar code device can be attached via the DIN-6P connector as depicted in the *Nomenclature*. (BCR is marked on the housing)

The barcode decoding software of T&A system supports most of the commercially available symbologies such as,

- CODE39
- CODE128
- INTERLEAVE 25
- INDUSTRIAL 25
- CODABAR
- UPC/EAN

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These symbologies are automatically discriminated by the decoding logic and can be individually enabled or disabled to discriminate unwanted entries.

2.3.2. Magnetic Card

A dual track magnetic card reader can be installed on Cipher-510 for ID entry. But a single-track magnetic card reader is used for time and attendance application normally. The magnetic card standard (whether JIS, ISO track 1, ISO track2, or ISO track 3) and the direction of scan is automatically detected by the decoding logic.

2.4. ID Entry Qualification

Cipher-510 provides several ways to qualify the ID entries made on the station. They are described below.

2.4.1. Company Code

A company code is a string of up to 30 characters which can be programmed into Cipher-510 to enable the qualification of all ID inputs. If there is an ID input which does not have the company code in the beginning of the ID (failed in company code checking), Cipher-510 will initiate a warning. This is usually used to check against out-siders. By programming the company code with a null string, this company code checking feature will be disabled.

2.4.2. ID Length

An ID length check can be enabled to prevent faulty entries. A 2-digitss ID length from 01 to 99 can be programmed into Cipher-510 to enable the checking. Only the ID entries with exactly the same ID length as programmed are accepted. An ID length setting of 00 will disable the ID length checking.

2.4.3. Duplicate Entries

Normally, Cipher-510 will record all ID entries. But if there is an ID entry with the same ID code, working shift type, and prefix code as the previous entry within 3 minutes, the new ID entry will be discarded (not recorded). This is to eliminate unnecessary duplicate entries made.

2.5. LCD Display

A 2 x 20 LCD is used to display current system time, scanned card ID, system message and so on. This is an easy-to-read wide viewing angle LCD equipped with LED back light and can

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easily be read even in a dim environment. The viewing angle can be adjusted via a variable resistor as depicted in the *Nomenclature*.

2.6. Membrane Keypad

A 16-key membrane keypad can be used for handy data entry, such as employee ID code, working shift number, setup value and so on.

F1 - F4 These keys are mainly used for working shift type selection (from 1 to 4). Each key was accompanied with a corresponding LED, one and only one of these four LEDs was lit to show the current *working shift type*. These keys are also used during setup, which will be described under the section *Setup*.

SHIFT This is an auxiliary key used to *toggle* usages of keys **0-9**. An accompanying LED is used to show the current shift status. When this LED was off, the **0-9** stand for normal numerics 0 to 9, otherwise the *upper-left* characters printed on the keypad are used (that is **A-F**, **FUNC** and so on). Basically, this key functions are similar to *CAPSLOCK* of conventional keyboards rather than *SHIFT*, the user simply presses it once to change the shift status without the need to press it all the time.

ENTER Entry delimiter/terminator, functions as *ENTER* or *RETURN* of conventional keyboards and is used to signify end of current entry.

0-9 numerics 0 to 9

A-F characters A to F

FUNC reserved, not applicable to current application

left arrow (◀) This key functions as *BACKSPACE* of conventional keyboards and is used to erase the pre-entered key during data entry.

right arrow (▶) This key functions as *SPACE* of conventional keyboards.

clear This key functions as *RUBOUT* of conventional keyboards and is used to clear the current data entry. Keys entered after previous **ENTER** will all be erased. This key has no effect on ID entries via scanning barcode or magnetic card.

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2.7. Data Memory & Backup Battery

A base memory of 128KB SRAM is equipped for data storage and is expandable up to 512KB. A 3.6V 60mAh rechargeable NiMH battery is used to keep the data when the main power is turned off. And since it is rechargeable, constant replacement of this battery is not necessary. Please be noted that the normal life of the NiMH battery is about 2 years.

2.8. Calendar Chip

An on board calendar chip is used to keep the system time running. This chip is also backed by the rechargeable NiMH battery on the main PCB board even when the main power was turned off. In a multi-station configuration, the master station will check the system time among all stations at every minute sharp. This is to keep the system time of all Cipher-510 station exactly the same.

2.9. Program Memory(Flash)

A 128 Kbytes flash memory is used to store the program code and is guaranteed to last at least 100,000 erase/program cycles. Differs from conventional RAMs, no battery is needed to keep the program or data stored in the memory.

2.10. Operational Backup Battery

When fully charged, the 1.2V by 7, 1500 mAh rechargeable NiCd battery pack keeps the Cipher-510 working after the external line power was down. This battery pack is charged as long as the line power is asserted (regardless of the main power switch) and automatically takes over when the line power was down. A battery monitoring circuit will activate the *BAT. LOW* warning LED when the battery is going to be drained and Cipher-510 will shutdown the system when the battery is almost fully drained. This shutdown circuit keeps the battery from fully drained, which will degrade the useful life of the battery. This battery keeps this time & attendance terminal almost non-interrupted and is a must under most circumstances.

These seven batteries are firmly packed and **should not** be torn apart by any means. The safe operating temperature for this battery pack ranges from -20°C to 50°C. Beyond this range, permanent destructions might occur. A separate battery holder provides further protection of the battery pack and eases the installation. This holder locates right underneath the main box as been depicted in the *Nomenclature* and is also used for mounting the Cipher-510 on the wall or on the table.

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2.11. LED Indicator

Several LEDs located at the top-left corner of the main-panel (other than those on the membrane keypad) are equipped to provide instant indications of current system status,

- POWER** This is a *red* LED to show the presence of *external line power*, it works even when the power switch is not turned on.
- READY** If the Cipher-510 is working properly, the *yellow* LED will be flashing with a period of 2 seconds all the time. This is the mandatory way to see whether the Cipher-510 is working or not.
- GOOD READ** This is a *green* LED and lit for one second upon successful decoding of bar code/magnetic card entry.
- BAT. LOW** This is a *red* LED to show the battery which is going to be drained. Usually the Cipher-510 can still works for 30 minutes to an hour after this LED was lit. Care should be taken that this LED works only when external line power was down, and the LED should be off if the line power was asserted.
- F1 to F4** These are *red* LEDs to show the working shift (F1, F2, F3, or F4).
- Shift** This is a *red* LED to show status of “Shift”.

2.12. Buzzer

Besides LEDs, a buzzer is equipped for further indication of the system status. Combinations of tones and periods are used to signify various conditions and will be more described in later sections.

2.13. Printer Port

A serial printer can be directly connected to the aux-RS232 port located at the rear panel of Cipher-510 (*RS-232C/DIO* is marked on the housing). If the on-line printing function is enabled, the ID entries are printed when they are made. This aids in immediate verifications or further examinations as a backup copy of all entries.

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2.14. Digital Input / Output

The Cipher-510 provides 2-digital inputs and 2-digital outputs for controlling and monitoring external devices. These inputs and outputs are photo-isolated and share the same DB-25 connector as the COM3 (*RS-232C/DIO* is marked on the housing).

For the T&A application, two digital output signals are provided for external speaker and door lock attachment. The first digital output which is connected to an external speaker/buzzer can be used for scheduling control, such as lunch time, coffee break, off duty, ... and so on. Cipher-510 will automatically activate the digital output according to a timetable programmed into Cipher-510. The timetable consists of 16 entries of starting time (hour & minute) and the desired ON duration (00 - 99) setting in seconds. The filling of the entries of the timetable can be in any order, and the Cipher-510 will constantly scan all the 16 entries to see if there is a match in the starting time and activates the digital output with the programmed duration. To eliminate (cancel) a pre-programmed timetable entry, simply changes its activation duration to 00, the Cipher-510 will ignore this entry. The following is an example of the timetable setting.

Entry No.	Starting Time	Duration	Relay Action
1	0800	10	10 seconds starts at 08:00
3	1600	15	15 seconds starts at 16:00
10	1200	20	20 seconds starts at 12:00
Others	don't care	00	none

The second digital output which is connected to a door lock can be used for access control. Cipher-510 will automatically activate the digital output for opening the door lock when user punches the card.

2.15. Station ID

A station ID is a 2-digit number (01 - 99) that is assigned (programmed) to each Cipher-510 station. It is used to identify each Cipher-510 station in the system and it plays an important role in RS-485 / RS-232 communications. Since the station ID is used to identify each Cipher-510 station in the system, there should not have any stations with the same station ID assigned.

2.16. RS232 Port

The RS232 port (COM1) is used for host computer connections. Baud rate, data bits, stop bits and parity settings can be selectable. The possible values for each setting are listed below.

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- Baud rate : 38400/19200 / 9600 / 4800 / 2400 / 1200 / 600 / 300
- Data Bits : 7 / 8
- Parity : Even / Odd / None
- Handshake : CTS-RTS / XON-XOFF / None

The phone-jack connector located on the rear panel of Cipher-510 (*RS-232C* is marked on the housing) is used for RS232.

2.17. RS485 Port

RS485 is a high speed multi-drop communication interface which allows up to 32 stations (nodes) to be connected on the same bus line and the total distance from the first Cipher-510 to the last one can extend to 1.2Km long. RS485 has been long used as industrial standard and is adequate for multi-station time & attendance applications. Being an efficient interface, it is also cost effective since inexpensive shielded twist-pair cables can be used.

The RS485 communication port of Cipher-510 is exclusively used for connecting multiple Cipher-510 stations. A unique communication protocol is utilized to ensure data security and integrity. There is an electrical limitation of the RS485 on the maximum number of nodes can exist on the RS-485 bus (32 stations). But by use of RS485 repeaters, the maximum number of Cipher-510 stations allowed on the RS485 bus can be extended to 99 stations.

The RS485 port intentionally occupies two connectors (male and female DB9 connectors located on the rear panel of Cipher-510 which *RS-485* is marked on the housing), that is same signals are connected to these two connectors. As one of them is male and the other one is female, if a machine is to be removed from the net for maintenance, cables from previous station can directly connects to the cable goes to the next station and the net remains unaffected.

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2.18. Mounting Style

Cipher-510 can either be mounted on a desk or on to a wall (wall mounted) as shown on the following figure. Normally Cipher-510s are shipped to customers in a desk mount style. By detaching the battery pack holders, turning the holder 180 degrees, and reattaching the holder, the Cipher-510 will be changed from desk top mounting style to wall mounted style.



Figure 2-1 Wall Mount and Desk Top Mount

3. Programming System Parameters

The system parameters of Cipher-510 T&A system can be programmed manually or by RS232 commands. Manually programming the Cipher-510 T&A system is described in this section and programming the Cipher-510 via RS232 commands will be described under the section **RS232 Command**.

Beside normal working mode, a special mode called manager mode is also provided to setup system parameters, maintain and so on. To prevent from neither illegal nor unwanted entry, a special label (master card) must be swiped followed by correct password entry.

3.1. Master Card

A special card ID is designated as the **master card**. Scanning this card will instruct the Cipher-510 to enter the **setup mode** and then the system parameters can be accessed. The default (factory) setting of the master card is **1234567890**.

3.2. Password

To further secure the system, a **password** (up to 6 digits) must be correctly entered after scanning of the master card. The default (factory) setting of the password is none which implies no password is needed.

3.3. Contents of Manager Mode

Upon successful entry, the following message will be shown on the display,

System Manager 1.Setup

Under this mode, 4 major tasks can be done as follows,

- Setup
- Self-test
- Initialize System
- Flash Clone

3.3.1. Programming Procedures

For maximum clearness, a step-by-step procedure from the beginning is described below.

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1. Make sure that the Cipher-510 is in working mode (510 displaying current system time on the LCD display). If not, the Cipher-510 might be already in the setup mode, press **F2** key to go back to the working mode.

99/03/01 12:00:10

2. Scan the **master card**. If successfully scanned with the correct master card, the Cipher-510 will show,

PASSWORD :

3. Now Cipher-510 is waiting for entry of the password. However, if the password was set to none, this message will not be shown and this step is simply ignored. The system manager must key in the password now. To avoid side-peeking the password, the screen will simply show "*" instead of the real password entered. Upon completion of the password entry, press the ENTER key. Note that neither the backspace key nor the clear key is active now, the system manager must enter the right password at one time. If the password was not correct, the Cipher-510 will activate a warning beep (lots of consecutive beeps) then go back to the working mode. If the password is correctly entered, Cipher-510 will be in the **System Management** mode.

System Manager
1.Setup

4. Press the ENTER key and now the Cipher-510 is in the setup mode and is ready to accept system parameter modification. The Cipher-510 will show the name of parameter on the upper side of the display and the original setting value on the lower side.

1. Line Connection:
=Master

5. Press ENTER key then you can change the setting value of this parameter. Use the "□" and "□" key for selecting a new setting value or type in a new value via numeric keys. Then press ENTER key to conclude the new setting value.

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1. Line Connection:
-><Single>

6. Instead of key in new value, simply press the "□" or "□" key will leave this setting unchanged and fine out another parameter. This is a handy way to simply peek the current settings. Note that the **backspace (Shift+7)** key and the **clear** key can be used for handy editing.
7. After all the system parameter modification are completed, the F1 key must be pressed to update these modifications and save the new settings into the program memory. System will restart with the new settings. If F2 key instead of F1 key is pressed, all modifications of the system parameters will be discarded and retain the original settings.

3.3.2. Setup

After enter the setup mode, user can program the setting of each system parameter via keypad. All the system parameters available are listed below with the parameter number shown on the headings. Detail descriptions are given and the allowed settings are shown.

1. Line Connection Setting

Selectable values of the communication line connection parameter are listed below.

- <Master> (default value)
- Reserved
- Single
- Slave

2. On Line Printing Setting

Selectable values of the On-line printing of the ID entries are listed below.

- <Disable> (default value)
- Enable

3. Prefix Code Setting

Selectable values of the prefix code are listed below.

- <Disable> (default value)
- Enable

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4. Keyboard Entry Setting

Selectable values of the keyboard entry are listed below.

- < Enable > (default value)
- Disable

5. Station Lock Setting

Selectable values of the station lock are listed below.

- <Not Locked> (default value)
- Locked

6. Station ID Setting

Acceptable values of the keyboard entry are list below. Note that In case of multi-station connection, care should be taken not to set more than one station with the same station ID which will cause mal-function of the internal RS485 communications.

- <1> (default value)
- integer up to 99

7. Master Card Setting

The master card ID can be modified as needed. However, differing from other parameter modifications, the new master card must be inputted by scanning the card not by entering from keyboard. Up to 20 characters of master card ID can be set.

- <1234567890> (default value)
- please scan the new master card

8. Password Setting

Up to 6-digits passwords can be set to further secure the system. Note that if a null string was entered, the password examination will be skipped when entering setup mode. And if a single **ENTER** key is pressed without preceding digits, it will be treated as entering a *null* password. That is, peeking only function is not available for this parameter since there is no way to distinguish between peeking-only and a null password.

- <none> (default value)
- enter the new password

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9. Time Setting

This is used to modify the system time of Cipher-510. A 12-digits value (YYMMDDHHNNSS) must be completely entered as follows,

- YY : last 2-digits of the year, for example 94 for 1994
- MM : month (1 - 12)
- DD : day of the month (1 - 31)
- HH : hour (24 hour format, 0 - 23)
- NN : minute (0 - 59)
- SS : second (0 - 59)

10. Timer Fine Tune Setting

A fine-tunable calendar chip is equipped in Cipher-510. The speed of the calendar chip can be tuned in units of ppm via a digital trimming register. The trimming range is from 0 to 255 ppm. The bigger value of the trimming register the slower the calendar chip runs. For instance, if the calendar chip is 1 second **slow** in one day then the value of the trimming register should **decrease** 12 to correctly adjust the calendar chip. During system initialization, this register is set to 186.

- <186> (default value)
- 0~255

11. ID Length Setting

A 2-digits value from 0 to 99 can be set to qualify the ID entries. If set to 0, ID length will not be checked.

- <0> (default value)
- 0~99

12 : Bar Code Symbology Setting

The Cipher-510 decoding software supports 6 types of symbology and each symbology can be individually enabled/disabled. Press the **ENTER** key for changing these settings and then press the **F2** key to conclude all the new settings.

12.1. Code 39

Selectable values of Code 39 are listed below.

- < Enable > (default value)
- Disable

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12.2. Code 128

Selectable values of Code 128 are listed below.

- < Enable > (default value)
- Disable

12.3. Interleave 25

Selectable values of Interleave25 are listed below.

- <Enable> (default value)
- Disable

12.4. Industrial 25

Selectable values of Industrial25 are listed below.

- <Enable> (default value)
- Disable

12.5. Codabar

Selectable values of Codebar are listed below.

- <Enable> (default value)
- Disable

12.6. UPC/EAN

Selectable values of UPC/EAN are listed below.

- <Enable> (default value)
- Disable

13 : COM1 Setting

The communication port (COM1) attributes can be changed individually. Press the **ENTER** key for changing these settings and then press the **F2** key to conclude all the new settings.

13.1 COM1 BaudRate

Selectable values of COM1 baud rate are listed below.

- 38400

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- 19200
- <9600> (default value)
- 4800
- 2400
- 1200
- 600
- 300

13.2 COM1 Parity

Selectable values of COM1 parity are listed below.

- <none> (default value)
- Odd
- Even

13.3 COM1 Data Bits

Selectable values of COM1 data bits are listed below.

- <8> (default value)
- 7

13.4 COM1 Handshake

Selectable values of COM1 stop bits are listed below.

- <none> (default value)
- XON
- CTS

14 : COM3/Aux Device Setting

The auxiliary communication port (COM3) attributes can be changed individually. Press the **ENTER** key for changing these settings and then press the **F2** key to conclude all the new settings.

14.1 COM3 BaudRate

Selectable values of COM3 baud rate are listed below.

- 38400

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- 19200
- <9600> (default value)
- 4800
- 2400
- 1200
- 600
- 300

14.2 COM3 Parity

Selectable values of COM3 parity are listed below.

- <none> (default value)
- Odd
- Even

14.3 COM3 Data Bits

Selectable values of COM3 data bits are listed below.

- <8> (default value)
- 7

14.4 COM3 Handshake

Selectable values of COM3 stop bits are listed below.

- <none> (default value)
- XON
- CTS

15. Alarm Table Setting

After selecting this parameter, the original settings will be shown on the display, for example,

15.Alarm 01 =16:00 010 SEC

For the example above, the original settings of the timetable entry 01 is 16:00 for 10 seconds.
Following steps can be adopted,

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- To modify this entry, enter a 7 digit string (HHMMDDD), where
 - HH : hour (24 hour format, 0 - 23)
 - MM : minute (0 - 59)
 - DDD : digital output duration in seconds (01 - 999, 00 if this entry is to be ignored)
- To exit from this parameter setting (peeking only), press **ENTER** key directly.
- Press the "□" or "□" key to shift to next timetable entry. The timetable entry will cycle from 01 to 16 accordingly.
- Press **F2** key to conclude above settings.

16. Workshift Table Setting

After selecting this parameter, the original settings will be shown on the display, for example,

16.work shift 01
=08:00-10:00 1

For the example above, the original settings of the timetable entry 01 is 08:00 to 10:00 for working shift type 1.

- To modify this entry, enter a 9-digits string (HHMMhhmmW), where,
 - HH : hour of the starting time (24 hour format, 0 - 23)
 - MM : minute of the starting time (0 - 59)
 - hh : hour of the ending time (24 hour format, 0 - 23)
 - mm : minute of the ending time (0 - 59)
 - W : working shift type (1 to 4, 0 if this entry is to be ignored)
- Press the "□" or "□" key to shift to next timetable entry. The timetable entry will cycle from 01 to 16 accordingly.
- Press **F2** key to conclude above settings.

17 : LCD Backlight Setting

The LCD backlight can be adjusted by this parameter setting. Acceptable setting values are list below.

- <high> (default value)
- off
- low
- medium

18 : Buzzer Volume Setting

The buzzer volume can be adjusted by this parameter setting. Acceptable setting values are list below.

- <loudest> (default value)
- louder

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- loud
- quiet

19 : Max Station ID Setting

The station ID number can be limited by this parameter setting. To modify this setting, enter a 2-digits number from 0 to 99.

- <99> (default value)
- 0-99

20 : Year Format Setting

The year format of system time can be selected as the 2-digits year or 4-digits year. Acceptable setting values are list below.

- 2-digit-year
- <4-digit-year>(default value)

3.3.3. Self Test

This mode provides a simple but yet efficient way for diagnostic. Press **ENTER** key for executing the following items test one by one,

- Flash test
- SRAM test
- Beeper test
- LCD test
- LED test
- DI & DO test
- COM1 test
- COM2 test
- COM3 test
- 485 test
- ADC test
- Calendar test
- Reader test
- Keypad test
- AT Keyboard test
- Shutdown test

3.3.4. Initiate System

This is used to set all system parameters to their default value and initialize the file systems. Care should be taken, as this will destroy all data stored in the memory.

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3.3.5. Clone

This is used to copy the program in FLASH memory to another terminal. Usually it is used for diagnostic or software update.

4. Cipher-510 Installation

This section contains the hardware information of Cipher-510. The Cipher-510 main board, the connections inside 510, the relay output port, the RS232 port and the RS485 ports are all described in this section.

4.1. Characteristics

Basic characteristics of the Cipher-510 are listed below,

4.1.1. Electrical

- Main Power Supply Voltage : 12V $\pm$ 5% DC (Unlike the Cipher-5000 series data terminal, this MUST be a regulated +12V DC)
- Power consumption : 0.5W maximum with LCD backlight off and no external devices attached

4.1.2. Environmental

- Humidity (operating) : non-condensed 20% to 90%
- Humidity (storage) : non-condensed 10% to 95%
- Temperature (operating) : 0 to 50 °C
- Temperature (storage) : -20 to 70 °C
- EMC regulation : FCC class A and CE approved

4.1.3. Physical

- Dimensions : 261 X 125 X 100 mm (including battery holder)
- Weight : 1 Kg including all batteries
- Material : ABS
- Color : Gray

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4.2. Nomenclature

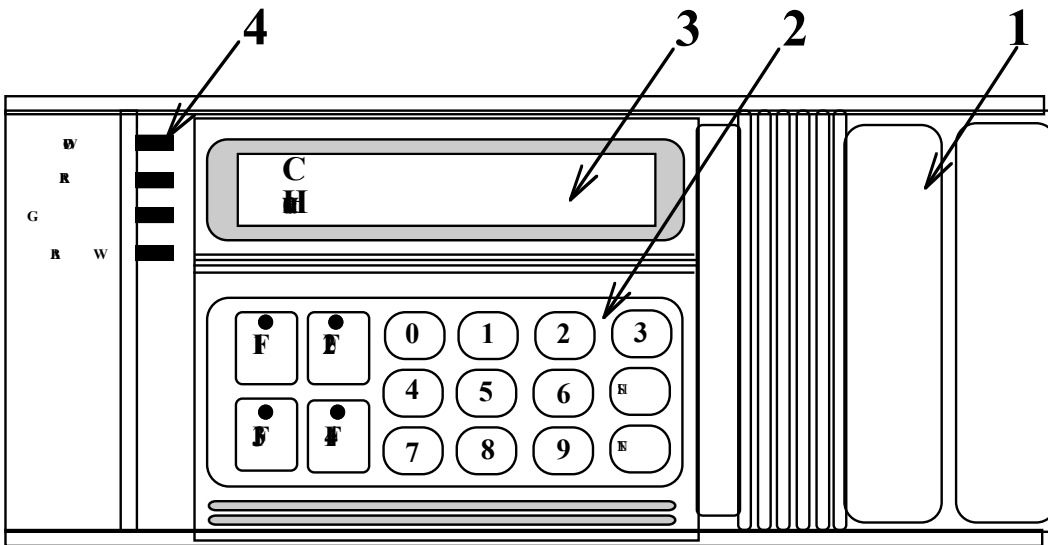


Figure 4-1 Main Panel

1. Slot-type reader
2. Membrane Keypad
3. LCD display
4. LED indicators, from top to bottom
 - (1) POWER (red)
 - (2) READY (yellow)
 - (3) GOOD READ (green)
 - (4) BATTERY LOW (red)

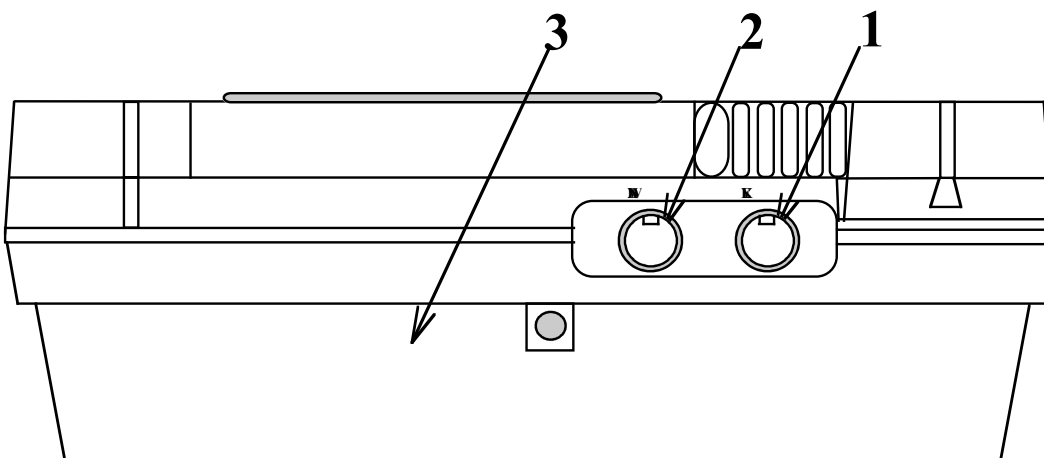


Figure 4-2 Front Panel

1. External AT keyboard
2. External Reader

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3. Battery Holder

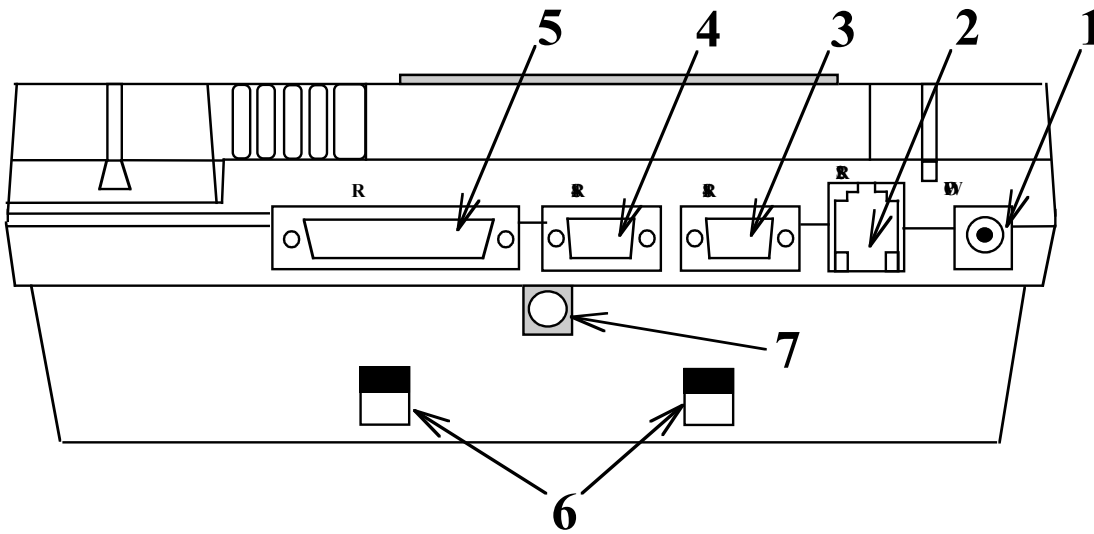


Figure 4-3 Rear

Panel

1. Main power connector
2. RS232 port (COM1)
3. RS485 port
4. RS485 port
5. RS232 port (COM3) and digital input/output
6. Holes for fixing Battery clippers
7. Holes for screw

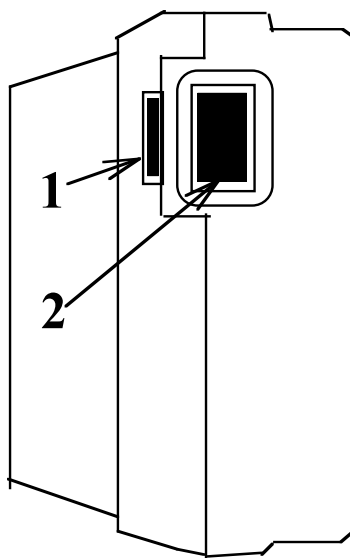


Figure 4-4 Left Panel

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1. LCD viewing angle adjust
2. Power switch

4.3. Cipher-510 Main Board

The following figure shows the outline of the Cipher-510 main board. The connectors, jumpers, and the main components of maintenance/installation interest are shown.

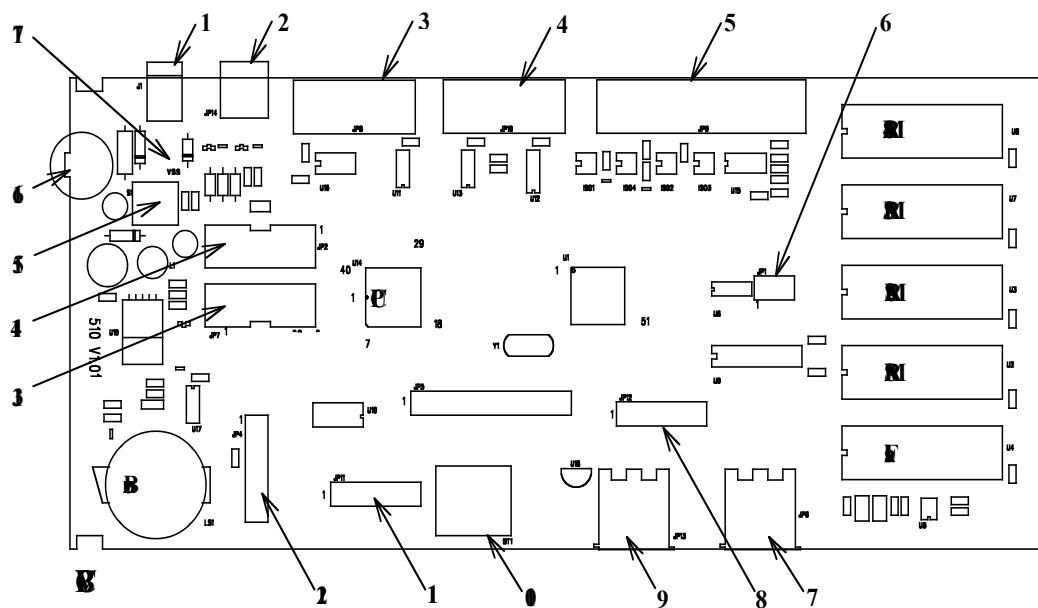


Figure 4-5 Left Panel

1. J1, External +12V DC
2. JP14, RS232 COM1
3. JP8, RS485
4. JP10, RS485
5. JP9, RS232 COM3 & Digital Input / Output
6. JP1, SRAM5-8 Chip Select
7. JP6, External Keyboard
8. JP12, connect for built-in Reader (READER 1)
9. JP13, wand port for external barcode reader (READER 2)
10. 3.6V NiCd Battery

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11. JP11, connect for READER 2
12. JP12, LED
13. JP7, LCD connector for 20X2, 20X4, 40X2
14. JP2, LCD connector for 40X4
15. S1, Power Switch
16. VR6, view angle adjust variable resistor
17. Operation Backup Battery Connector

4.4. Power Source

The 510 can be powered from 2 sources: the external +12V or operation backup battery. If line power was down, the 1500mAh NiCd battery pack then took the place to provide the system power. The switching from external DC power to the battery is accomplished by a simple pair of diodes and is not even noticed by the operator. However, loss of the main power can be seen from the POWER LED on the panel.

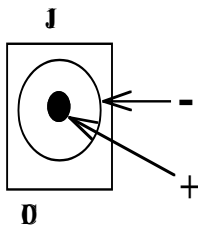


Figure 4-6 Main Power Connector

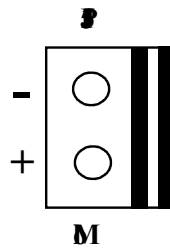


Figure 4-7 Battery Pack Connector

4.5. Magnetic Card Reader Connector

There are total 2 reader ports provided, each can be either a Barcode slot reader, Barcode Scanner (Wand/Laser emulation), or up to dual-track magnetic card reader. They are equivalent in both hardware and software. However, Cipher-510 assumes that one of them is a built-in slot-type reader (READER 1) whereas the other is an external attached scanner (READER 2). Their connectors and pin-assignments are listed below. Beware that, in order to decode barcode and magnetic card at the same time, some signals share the same pin. However, the software is able to tell which types of the readers are attached.

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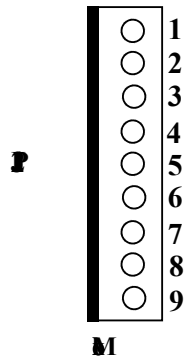


Figure 4-8 Reader 1 Connector

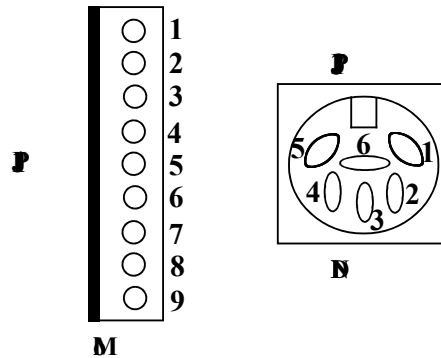


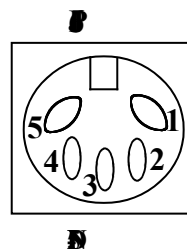
Figure 4-9 Reader 1 Connector

JP11 & 12	Barcode	Magnetic	DIN-6 (JP13)
1	Start Of Scan	Not used	5
2	Data	Clock 1	2
3	Good Read	Not used	
4	Not Used	Data 1	
5	Switch	Clock 2	4
6	Power Enable	Not used	6
7	Ground	Ground	3
8	Not used	Data 2	
9	Vcc, +5V	Vcc, +5V	1

As there are not so many pins in JP13, the external reader, i.e. READER 2 is limited to barcode readers only.

4.6. External Keyboard

Besides the built-in membrane keypad, an external AT-compatible keyboard can be attached for handy data entry. The connector and pin assignment conforms to PC/AT standard keyboard.



1. clock
2. ground
3. data
4. +5V
5. No connection

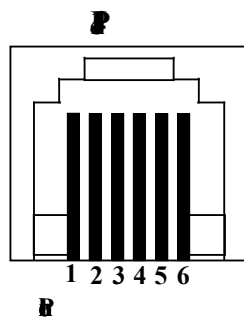
Figure 4-10 External Keyboard Connector And Pins Assignment

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4.7. RS232 Connection

The RS232 connection between master station and the host computer is made through the male phone jack connector located at the rear panel of Cipher-510. The RS232 port is enabled (functioning) only when the **line connection setting** is set either to **stand alone single station** or **multi-station on-line master**.

Besides the pin assignments of the RS232 port, both the hardware setting and the software setting should be checked before any physical connections are made between Cipher-510 and the host computer. The pin assignments of the RS232 port are shown below. The DTR and RTS signals are always set as long as Cipher-510 is operating.



1. No Connection
2. Ground
3. RTS
4. CTS
5. Receive data
6. Transmit data

Figure 4-11 RS-232 Connector And Pins Assignment

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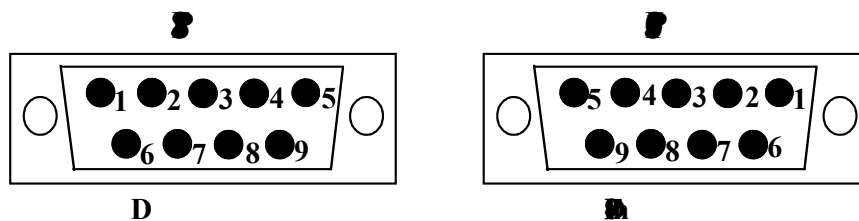
The factory settings of the RS232 port are 9600 baud rate with 8 data bits, no parity, and 1 stop bit. And the Cipher-510s delivered from factory all have the line connection setting been set to multi-station on-line master.



Figure 4-12 RS-232 Connection between Cipher-510 and Host

4.8. RS485 Connection

The RS485 ports are used to connect multiple Cipher-510s. Every Cipher-510 station is connected to the RS485 bus line in a daisy chain style (no branches allowed). The bus line starts from the female DB9 connector of master station. The female DB9 connector is always for connecting an RS485 cable to the next 510, and the male DB9 connector is for connecting an RS485 cable from the previous station.



1. Ground
2. Data -
3. Data +
9. +5V

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Others : No Connection

Figure 4-13 RS-485 Connector And Pins Assignment



Figure 4-14 RS-485 Connection between Cipher-510st

The RS485 cable being used to connect Cipher-510s should be a twist pair cable with shielding and have a male DB9 connector at one end and a female DB9 connector at the other. The connections of the cable are listed below.

- Pin 1 to pin 1 of both ends
- Pin 2 to pin 2 of both ends
- Pin 3 to pin 3 of both ends

The signal lines of pin 2 and pin 3 should use the wires in the same twist pair, and the cable shielding should be used to connect pin 1 of both ends.

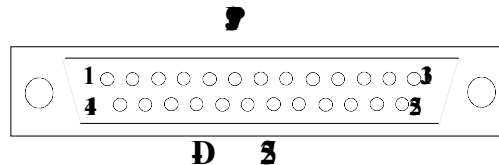
The following points must be checked before RS485 connections are made to 510s.

- One and only one Cipher-510 station can be the master station of the RS485 network. The rest of the Cipher-510 stations should be the slave station. The host computer can only be connected to the master station through the RS232 port.
- For the master station, the line connection setting should be set to **multi-station on-line master**. The RS485 port of the master station is active only when the line connection setting is set to multi-station on-line master.
- For the slave stations, the line connection setting should be set to **multi-station on-line slave**.
- No duplicate station IDs are allowed in the RS485 network.

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4.9. Serial Port For Printer & Digital I/O

The Cipher-510 provides 2-digital inputs and 2-digital outputs for controlling and monitoring external devices. These inputs and outputs are photo-isolated and share the same DB-25 connector as the COM3 (RS-232C/DIO is marked on the housing). A serial printer can also be directly connected to the COM3 port for on-line printing.



2. Transmit data
3. Receive data
4. RTS
5. CTS
7. Ground
9. Output 0 Emitter
10. Output 0 Collector
11. Output 1 Emitter
12. Output 1 Collector
13. Input 0 Cathode
14. Input 0 Anode
15. Input 1 Cathode
16. Input 1 Anode

Figure 4-15 Serial Port Connector And Pins Assignment

4.10. WAND Port

This port is used to connect an external WAND or barcode slot. The pin assignments are shown below.

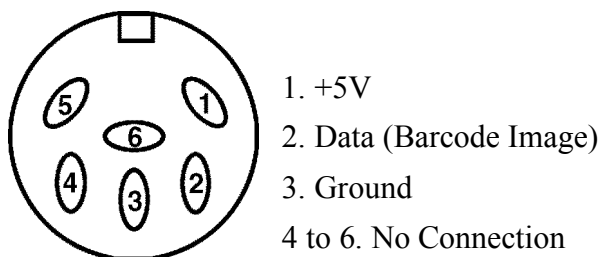


Figure 4-16 WAND Connector And Pins Assignment

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4.11. Change Memory Capacity

The step by step procedures for changing (increase or decrease) the data memory capacity are listed below.

- Turn off Cipher-510.
- Remove all the SRAM chips from socket on the memory card. This step must not be omitted. This is to erase the original contents of SRAM.
- Insert the desired number of memory chips (at least 1 and up to 4 memory chips with the same memory type) onto the empty sockets. The insertion of memory chips must be added sequentially from the start and then the software can correctly recognize them. The sequence is U2, U3, U7 then U8 (on the PCB, from lower right to upper-right). Due to limited PCB space, only 4 sockets are provided, if more than 4 SRAMs are to be used, rest of the SRAMs can be piggy-backed on U2 to U8 and then connect their chip select pins to JP1.
- Turn on the Cipher-510. Now the Cipher-510 should be operating. If not, please check all the connections and the memory chips should be properly inserted on sockets.

4.12. Change Mounting Style

The Cipher-510 can be in desktop mounting style or in wall mounting style. The procedures for changing the mounting style are listed below.

- Remove the screw on top of the battery pack holder.
- Remove the battery pack holder by pushing the holder to the right.
- Turn the holder 180 degrees and attach the holder back to Cipher-510.
- Secure the screw just removed.

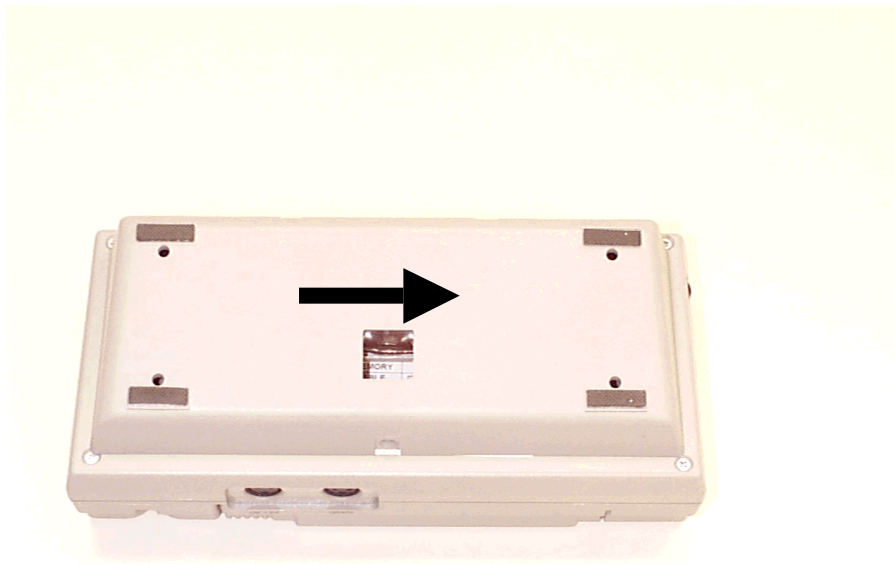


Figure 4-17 Remove The Battery Pack Holder

5. Operating 510

This section provides a step by step procedures in using the Cipher-510 time & attendance terminal. Assumptions have been made here that these terminals have been properly installed. Depends on the system configuration and setup, some of the procedures can be omitted.

- Turn the main power switch off.
- Connect the power cable. The **POWER** LED should be lit. If not, check the power cord connection.
- Turn on the power switch. The Cipher-510 will activate 3 beeps upon a successful startup and the LCD will show the start up messages.

510 Time Attendance
Ver. 1.50

The first half of this message is the model of the terminal, which is Cipher-510 and the second half is the software name. The version number **V1.4** is shown on the lower part of display. The model name, the software version number and the machine serial number have significant meaning in maintenance purpose and this start up message together with the serial number must be specified when requesting service.

This start up message stays on the screen for about 2 seconds. Then the Cipher-510 will show the available space of SRAM (data memory).

Free Memory:
SRAM = 243689 bytes

After this, the Cipher-510 will be in normal operation. The Cipher-510 will be constantly showing the system time on the display and it is ready to accept ID entries.

99/05/20 16:41:24

- It is recommended to do the following checks to make sure that the Cipher-510 is working properly.
 - The system time on the display should be updated like a normal electrical clock.
 - The **ready** LED should blink on a period of 2 seconds.
 - One and only one of the 4 **working shift** LEDs should be lit to show the current shift type.
 - Other LEDs should be off.

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- If manual selecting of the working shift type is required, press the desired key (**F1-F4**). Besides one short beep, the corresponding LED will be lit whereas the original working shift LED should be off. This procedure can be repeated as many times as necessary. However, it should be noted as mentioned in previous sections, the ID entry must be done within 5 seconds otherwise the shift number will be restored in the Cipher-510 according to the **automatic shift change timetable**. If the **automatic-shift-type-change** is not defined in the time when the working shift type is changed, Cipher-510 will stay on the new shift type.
- If the **prefix code** was enabled, the employee must press one of the 0-9 keys to input the prefix code (1-digit, no **ENTER** key needed) before any ID entry. Besides one short beep, the prefix code will also be shown on the display for verifications. The ID also must be entered within 5 seconds after the prefix code is pressed otherwise the prefix code will be canceled in the Cipher-510.
- Scan ID card or input ID code via keyboard (with **ENTER** key as delimiter) if **ID entry from keyboard** is enabled. As the card ID is successfully entered, besides one long beep, the **GOOD READ** LED should be lit for 1 second and the ID will be shown on the second line of the display for about 1 second (for verifications). After this, Cipher-510 will be ready for further entries.

99/05/20 16:41:30
12345

employee ID = 12345

If **prefix code** was enabled and the employee forgot to enter the prefix code, the Cipher-510 will show an error message and ask for a retry.

NO PREFIX

- Go to step 5 for further entry.

6. RS232 Command

This chapter explains how to control the Cipher-510 via the RS232 port. Even in the multi-station connection, the host computer can still get access to each station via RS232 port through the master station. All these commands are summarized as an easy look-up table in the appendix.

Each communication transaction starts from the host side and ends with an echoed message from the station (stand-alone, or the master station). The carriage return (hex0d) is used as the delimiter/terminator of each command or message. Since this carriage return is a **must**, it is not shown in the paragraphs below. If any format error occurred, the station would echo a **NAK** message.

Commands have been categorized into 3 groups according to their functions. Their formats and usages are described below.

6.1. Data Management Commands

The commands described in this section are used to manipulate the ID entry data stored in Cipher-510. Every ID entry made is stored as a **record** in the memory of Cipher-510. The host computer must send commands to the master station in order to read the records (the **READ** command). The records are always read from the top of the data memory. After a record has been read, the host computer must send another command (the **REMOVE** command) to remove the same record just being read in order to read the next one. So the **READ** command and the **REMOVE** command must be sent in pairs to read the successive records stored in Cipher-510. If the host computer keeps sending the **READ** command without a **REMOVE** command followed, the host computer will always get the same data record.

On the contrary, if the master station should receive a **REMOVE** command without a preceding **READ** command, no records will be removed from the data memory. That is, a record will be removed by the **REMOVE** command only after the record has been read by a **READ** command.

If there is no record in the data memory of 510, the master station will return an **OVER** message when a **READ** or **REMOVE** command is received.

READ

Format **READ**

Usage Read one record from **top** of the data memory.

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Return **Kppyyymmddhhnnabcq..q**

K : This letter is always prefixed to the data record of Cipher-510.

pp : A 2-digit station ID indicates the station on which the ID entry was made.

yy : last 2-digitss of the year when the ID entry was made.

mm : month of the year when the ID entry was made.

dd : day of the month when the ID entry was made.

hh : hour of the day when the ID entry was made (24-hour format).

nn : minute when the ID entry was made.

a : This character is always **0**.

b : 1-digit indicates working shift type (1 - 4).

c : 1-digit indicates prefix code (0 - 9). If prefix code is not enabled, this digit will always be **0**.

q..q : card ID

Note A **REMOVE** command must be issued to remove this record from data memory.

REMOVE

Format **REMOVE**

Usage Remove the record just read from the data memory.

Return **NEW** if successfully executed
 OVER if data memory is empty

Note This command is effective only after the **READ** command has been executed.

CLEAR

Format **CLEAR**

Usage Initialize memory. All data records, timetables, lock station setting, and ID length settings will be erased.

Return **DONE**

X

Format **X**

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Usage Ask the master station to return the station IDs of the Cipher-510 stations connected on the RS485 network. This is quite useful for system maintenance as to see if the RS485 communication is properly working or not.

Return aabb....pp

aa, bb, ..., pp are all 2-digit station IDs indicate the Cipher-510 stations connected on the RS485 network.

Note This command applies only to the multi-station on-line master. The result would be meaningless on the stand alone single station.

TR

Format TR

Usage Get current system time.

Return yymmddhhnn

yy : last 2-digitss of the year

mm : month

dd : day of month

hh : hour (in 24-hour format)

nn : minute

ss : second

TWyyymmddhhnnss

Format TWyyymmddhhnnss

TW : command identifier

yy : last 2-digitss of the year

mm : month

dd : day

hh : hour (in 24-hour format)

nn :minute

ss :second

Usage Set new system time.

Note There is no station ID required in this command. The master station will keep the system time synchronized among all Cipher-510 stations.

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6.2. Inquire System Parameter Setting Commands

The commands described in this section are used to get current system parameter settings of Cipher-510.

G01pp

Format **G01pp**

G01 : command identifier

pp : 2-digit station ID

Usage Get current **line connection** setting of station **pp**.

Return A 2-digit string indicates current setting.

00 : reserved

01 : stand alone single station

10 : multi-station on-line slave

11 : multi-station on-line master

G03pp

Format **G03pp**

G03 : command identifier

pp : 2-digit station ID

Usage Get current **on-line printing** setting of station **pp**.

Return A 1-digit string indicates current setting.

0 : disabled

1 : enabled

G12pp

Format **G12pp**

G12 : command identifier

pp : 2-digit station ID

Usage Get current **bar code symbology** setting of station **pp**.

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Return **abcdef**

- a** : Code 39 setting
- b** : Code 128 setting
- c** : Interleave 25 setting
- d** : Industrial 25 setting
- e** : Codabar setting
- f** : UPC/EAN setting

Each digit can be **0** for disable or **1** for enable.

G13pp

Format **G13pp**

G13 : command identifier
pp : 2-digit station ID

Usage Get current **prefix code** setting of station **pp**.

Return A 1-digit string indicates current setting.

- 0** : disabled
- 1** : enabled

G14pp

Format **G14pp**

G14 : command identifier
pp : 2-digit station ID

Usage Get current **ID entry from keyboard** setting of station **pp**.

Return A 1-digit string indicates current setting.

- 0** : keyboard entry not allowed
- 1** : keyboard entry allowed

G18pp

Format **G18pp**

G18 : command identifier

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pp : 2-digit station ID

Usage Get current **master card ID** setting of station **pp**.

Return A string indicates current setting.

G19pp

Format G19pp

G19 : command identifier

pp : 2-digit station ID

Usage Get current **password** setting of station **pp**.

Return A string indicates current setting.

NRppnn

Format NRppnn

NR : command identifier

pp : 2-digit station ID

nn : 2-digit (01 - 16) indicates the entry number of the relay output timetable inquired

Usage Get current relay output timetable entry of station **pp**.

Return hhmmddd

hh : hour of the starting time

mm : minute of the starting time

ddd : relay activate duration in seconds (**01** - **99**) or **0** (entry undefined)

DRppnn

Format DRppnn

DR : command identifier

pp : 2-digit station ID

nn : 2-digit (01 - 16) indicates the entry number of the automatic-shift-change timetable inquired

Usage Get current automatic-shift-change timetable entry of station **pp**.

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Return **hhmmxxyyww**

hh : hour of starting time

mm : minute of starting time

xx : hour of ending time

yy : minute of ending time

w : working shift type (**1 - 4**) or **0** (entry undefined)

FRpp

Format **FRpp**

FR : command identifier

pp : 2-digit station ID

Usage Get current **ID length** setting of station **pp**.

Return A 2-digit string indicates current setting.

VRpp

Format **VRpp**

VR : command identifier

pp : 2-digit station ID

Usage Get current **company code** setting of station **pp**.

Return **n.....n**

n.....n : current company code setting

ABpp

Format **ABpp**

AB : command identifier

pp : 2-digit station ID

Usage Get current **firmware information** of station **pp**.

Return **510 T&A_150**

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6.3. Program System Parameter Commands

The commands described in this section are used to program the system parameters of Cipher-510. The host computer should receive a **DONE** string as the returning message to indicate success when a command is sent.

The system parameters of Cipher-510 are stored in flash memory and are changed immediately when the setting commands are received.

S01ppnn

Format **S01ppnn**

S01 : command identifier

pp : 2-digit station ID

nn : 2-digit setting value

00 : reserved

01 : stand alone

10 : slave

11 : master

Usage Set **line connection** setting of station **pp**.

S03ppn

Format **S03ppn**

S03 : command identifier

pp : 2-digit station ID

n : 1-digit setting value

0 : disabled

1 : enabled

Usage Set the **on-line printing** setting of station **pp**.

S12ppabcdef

Format **S12ppabcdef**

S12 : command identifier

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pp : 2-digit station ID

abcdef : 6-digit setting value

a : Code39

b : Code128

c : Interleave 25

d : Industrial 25

e : Codabar

f : UPC/EAN

Each digit can be **0** for disable or **1** for enable.

Usage Set the **bar code symbology** setting of station **pp**.

S13ppn

Format S13ppn

S13 : command identifier

pp : 2-digit station ID

n : 1-digit setting value

0 : disabled

1 : enabled

Usage Set the **prefix code** setting of station **pp**.

S14ppn

Format S14ppn

S14 : command identifier

pp : 2-digit station ID

n : 1-digit setting value

0 : ID entry from keyboard not allowed

1 : ID entry from keyboard allowed

Usage Set the **ID entry from keyboard** setting of station **pp**.

S18ppn...n

Format S18ppn...n

S18 : command identifier

pp : 2-digit station ID

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n...n : new master card ID, up to 20 characters

Usage Set the **master card ID** setting of station **pp**.

S19ppn...n

Format S19ppn...n

S19 : command identifier

pp : 2-digit station ID

n...n : new password, up to 6 digits

Usage Set the **password** setting of station **pp**.

NWppnnhhmmddd

Format NWppnnhhmmddd

NW : command identifier

pp : 2-digit station ID

nn : 2-digit (01 - 16) indicates the entry number of the relay output
timetable desired

hh : hour of the starting time

mm : minute of the starting time

ddd : relay activate duration in seconds (1 - 909) or 0 (entry undefined)

Usage Set the setting of relay output timetable entry of station **pp**.

DWppnnhhmmxxyyww

Format DWppnnhhmmxxyyww

DW : command identifier

pp : 2-digit station ID

nn : 2-digit (01 - 16) indicates the entry number of the automatic-shift-
change timetable desired

hh : hour of starting time

mm : minute of starting time

xx : hour of ending time

yy : minute of ending time

w : working shift type (1 - 4) or 0 (entry undefined)

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Usage Set the setting of the automatic-shift-change timetable entry of station **pp**.

FWppnn

Format FWppnn

FW : command identifier

pp : 2-digit station ID

nn : 2-digit ID length setting from **01** to **99** or **00** to disable the ID length checking

Usage Set the **ID length** setting of station **pp**.

VWppn....n

Format VWppn....n

FW : command identifier

pp : 2-digit station ID

n...n : new company code setting up to 30 characters

Usage Set the company code for ID entry qualification of station **pp**.

Lnpp

Format Lnpp

L : command identifier

n : 1-digit setting value

0 : resume normal operation

1 : lock the station

pp : 2-digit station ID

Usage Set the **station lock** setting of station **pp**.

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RS232 Command Listing

The RS232 commands are tabulated below for quick look-up. Please refer to the section **RS232 Command** for detail description on each command.

Data Management Commands

<i>Format</i>	<i>Usage</i>	<i>Return</i>
READ	Read 1 record of data	<i>OVER</i> : buffer is empty <i>Kppyyymmddhhnnabcq..</i> <i>.q</i> where, <i>K</i> :"K", identifier of 510 <i>a</i> :"0" <i>b</i> :working shift (1-4) <i>c</i> :prefix code (0-9) <i>q...q</i> :employee ID
REMOVE	Remove the record just read	<i>NEW</i> :done <i>OVER</i> :buffer empty
CLEAR	Initialize memory	<i>DONE</i> :done
X	on-line stations inquiry	<i>aabb..pp</i> each 2-digitss represent one station ID
TR	System time	<i>yyymmddhhnn</i> <i>yy</i> :year <i>hh</i> :hour <i>mm</i> :month <i>nn</i> :minute <i>dd</i> :day <i>ss</i> :second
TWyyymmddhhnn	System time	<i>Yy</i> :year <i>hh</i> :hour <i>Mm</i> :month <i>nn</i> :minute <i>dd</i> :day <i>ss</i> :second

Inquire System Parameter Setting Commands

<i>Format</i>	<i>Usage</i>	<i>Return</i>
G01pp	Line connection	00:reserved, 10:slave 01:stand alone, 11:master
G03pp	On-line printing	0:disable, 1:enable

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G12pp	Barcode symbologies	ABCDEF A:Code 39 B:Code 128 C:Interleave 25 D:Industrial 25 E:Coda-Bar F:UPC/EAN 0:disable, 1:enable
G13pp	Prefix code	0:disable, 1:enable
G14pp	ID code keyboard entry	0:disable, 1:enable
G18pp	Master card	nn.nn , current master card
G19pp	Password	nn.nn , current password
NRppnn	Relay output timetable	Hhmmdd nn:entry number from 01 to 16 hh:starting hour mm:starting minute ddd:duration
DRppnn	Automatic shift change timetable	hhmmxxyyw nn:entry number from 01 to 16 hh:starting hour mm:starting minute xx:end hour yy:end minute w:working shift from 1 to 4
FRpp	ID length	nn :ID length
VRpp	Get current company code	n...n:current company code

Program system Parameter Commands

<i>Format</i>	<i>Usage</i>	<i>Parameter</i>
S01ppnn	Line connection	00:reserved, 10:slave 01:stand alone, 11:master
S03ppn	On-line printing	0:disable, 1:enable
S12ppABCDEF	Barcode symbologies	A :Code 39 B :Code 128 C :Interleave 25 D :Industrial 25 E :Coda-Bar F :UPC/EAN

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		0:disable, 1:enable
S13ppn	Prefix code	0:disable, 1:enable
S14ppn	ID code keyboard entry	0:disable, 1:enable
S18ppnn..nn	Master card	nn..nn :master card, up to 20 haracters
S19ppnn..nn	Password	nn..nn : password, up to 6 digits
NWppnnhhmmdd	Set relay output timetable	Nn :entry number from 01 to 16 Hh :starting hour Mm :starting minute Ddd :duration
DWppnnhhmmxxyw	Set automatic shift change timetable	Nn :entry number from 01 to 16 hh :starting hour mm :starting minute xx :end hour yy :end minute w :working shift from 1 to 4
FWppnn	ID length	nn :ID length allowed, from 0 to 99
VWppn...n	Set company code	n...n:company code up to 30 characters
Lnpp	Station lock	0:unlock, 1:lock

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System Parameters List

System parameters for setup mode are listed below according to their parameter numbers.

No.	Meaning	format	Value
01	Line connection	bb	00:reserved 01:stand-alone 10:multi-station slave 11:multi-station master
03	Printer enable/disable	b	0:disable, 1:enable
06	RS232 baud rate	bbb	000:9600, 100:2400 001:19200, 101:1200 010:9600, 110:600 011:4800, 111:300
07	RS232 parity	bb	00,01:not used 10:even 11:odd
08	RS232 data bits	b	0:7, 1:8 bits
09	RS232 stop bits	b	0:1, 1:2 bits
11	Station ID	bb	01-99
12	Enable bar code type	ABCDEF	A:Code 39 B:not used C:Interleave 25 D:Industrial 25 E:Codabar F:UPC/EAN 0:disable, 1:enable
13	Prefix enable	b	0:no, 1:yes
14	ID keyboard entry	b	0:disable, 1:enable
18	Master Card	none, scan card only	master card ID up to 20 characters
19	Password	d..d	up to 6 digits
20	System time	yymmddhhnn	12-digit system time as yy:year mm:month dd:day hh:hour nn:minute ss:second
21	Relay output timetable	nnhhmmddd	nn:entry number from 01 to 16 hh:hour mm:minute ddd:duration in

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			seconds from 1 to 999
22	Automatic shift change timetable	nnhhmmxxyyww	nn:entry number from 01 to 16 hh:starting hour mm:starting minute xx:end hour yy:end minute w:working shift from 1 to 4
23	ID length	nn	0-99
24	station lock	b	0:unlocked, 1:locked

510 T & A User's Manual

Packing

Standard Packing :

- This user's manual
- The Cipher-510 main unit
- Power Adaptor (110VAC or 220VAC)
- RS232 Cable
- Default System Master Card (**1234567890**)

Optional Accessories :

- Barcode Slot Reader or Magnetic Card Reader
- Operational Backup Battery
- WAND

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Physical Specification

Dimension	261 mm (L) X 125 mm (W) X 100 mm (H)
Weight	About 1kg, excluding the battery pack and the slot-type reader.
Power Supply	DC 10-15V, 12V (typical)
Power Consumption	3 VA (max.), excluding the slot-type reader.
Temperature	Operation : -5°C to 45°C Storage : -20°C to 70°C
Humidity	Operation : 15% to 90% Storage : 5% to 95%



Cipher-510

Programmable

Terminal

User's Guide



CipherLab Co., Ltd.

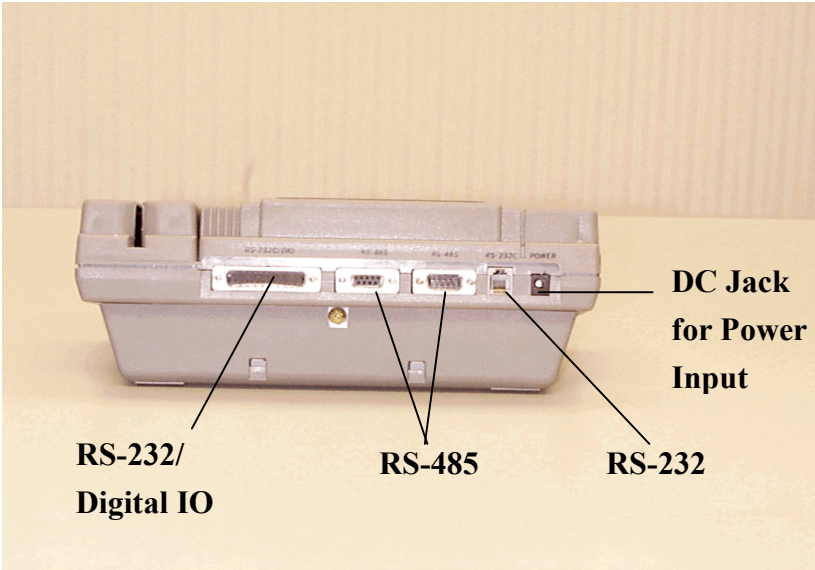
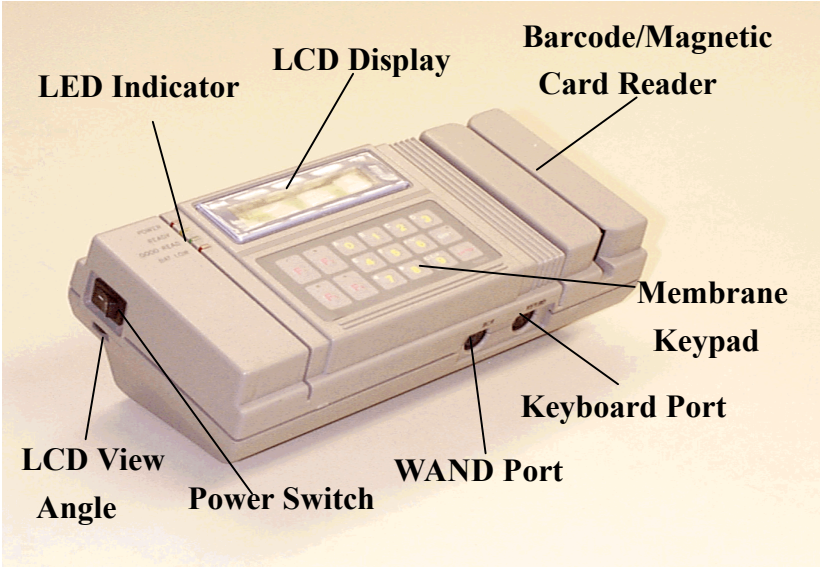
V1.0

1. Packing

This packing includes:

- (1) This User's Guide
- (2) The User's Manual Disk
- (3) The Cipher-510 main unit
- (4) Power Adaptor (110VAC or 220VAC)
- (5) RS232 Cable
- (6) Default System Master Card (1234567890)

2. Components



3. Installation

3.1. Power Source

The Cipher-510 can be powered from 2 sources: the external +12V or operation backup battery. If line power was down, the 1400mAh NiCd batterypack then took the place to provide the system power.

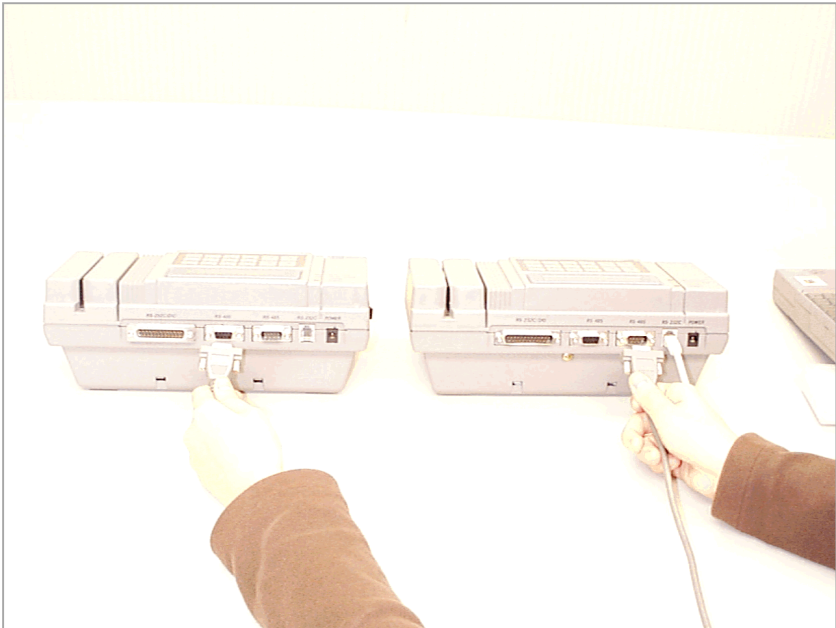
3.2. RS-232 Connection

The RS-232 connection between master station and the host computer is made through the phone jack connector located at the rear panel of Cipher-510. Besides the pin assignments of the RS232 port, both the hardware setting and the software setting should be checked before any physical connections are made between Cipher-510 and the host computer.



3.3. RS-485 Connection

The RS-485 ports are used to connect multiple Cipher-510s. Every Cipher-510 station is connected to the RS485 bus line in a daisy chain style (no branches allowed). The bus line starts from the female DB9 connector of master station. The female DB9 connector is always for connecting an RS-485 cable to the next 510, and the male DB9 connector is for connecting an RS485 cable from the previous station.



3.4. WAND Port

This port is used to connect an external WAND or barcode slot.

3.5. External Keyboard Port

Besides the built-in keypad, an external PC/AT keyboard can be attached for handy data entry.

3.6. Serial Port For Printer & Digital I/O port

The Cipher-510 provides 2-digital inputs and 2-digital outputs for controlling and monitoring external devices. These inputs and outputs are photo-isolated and share the same DB-25 connector as the COM3 (RS-232C/DIO is marked on the housing). A serial printer can also be directly connected to the COM3 port for on-line printing.

3.7. Change Mounting Style

The Cipher-510 can be in desktop mounting style or in wall mounting style.



4. Programming System Parameters

The system parameters of Cipher-510 can be programmed manually or by RS232 commands.

4.1. Manually programming

1. Power on the Cipher-510 and scan the master card. Now Cipher-510 is waiting for entry of the password. However, if the password was set to none, this message will not be shown and this step is simply ignored. The system manager must key in the password now. If the password is correctly entered, Cipher-510 will be in the System Management mode. Under this mode, 4 major tasks can be done as follows,

(1) Setup

- a. Press the ENTER key and now the Cipher-510 is in the setup mode and is ready to accept system parameter modification. The Cipher-510 will show the name of parameter on the upper side of the display and the original setting value on the lower side.

1. Line
Connection:
=Master

- b. Press ENTER key then you can change the setting value of this parameter. Use the "□" and "□" key for selecting a new setting value or type in a new value via numeric keys. Then press ENTER key to conclude the new setting value.

1. Line
Connection:
-><Single>

- c. Instead of key in new value, simply press the "□" or "□" key will leave this setting unchanged and fine out another parameter. This is a handy way to simply peek the current

settings. Note that the **backspace (Shift+7)** key and the **clear** key can be used for handy editing.

- d. After all the system parameter modification are completed, the F1 key must be pressed to update these modifications and save the new settings into the program memory. System will restart with the new settings. If F2 key instead of F1 key is pressed, all modifications of the system parameters will be discarded and retain the original settings.
- e. Followings are the system parameters,
 - (a) Line Connection Setting
 - (b) On Line Printing Setting
 - (c) Prefix Code Setting
 - (d) Keyboard Entry Setting
 - (e) Station Lock Setting
 - (f) Station ID Setting
 - (g) Master Card Setting
 - (h) Password Setting
 - (i) Time Setting
 - (j) Timer Fine Tune Setting
 - (k) ID Length Setting
 - (l) Barcode Type Setting
 - (m) COM1 Setting
 - (n) COM3/Aux Device Setting
 - (o) Alarm Table Setting
 - (p) Workshift Table Setting
 - (q) LCD Backlight Setting
 - (r) Buzzer Volume Setting
 - (s) Max Station ID Setting
 - (t) Year Format Setting

(2) Self-test

This mode provides a simple but yet efficient way for diagnostic. Press **ENTER** key for executing the following items test one by one,

- a. Flash test
- b. SRAM test
- c. Beeper test
- d. LCD test
- e. LED test
- f. DI & DO test
- g. COM1 test
- h. COM2 test
- i. COM3 test
- j. 485 test
- k. ADC test
- l. Calendar test
- m. Reader test
- n. Keypad test
- o. AT Keyboard test
- p. Shutdown test

(3) Initialize System

This is used to set all system parameters to their default value and initialize the file systems. Care should be taken, as this will destroy all data stored in the memory.

(4) Flash Clone

This is used to copy the program in FLASH memory to another terminal. Usually it is used for diagnostic or software update.

4.2. RS232 Command

Each communication transaction starts from the host side and ends with an echoed message from the Cipher-510. The carriage return

(hex0d) is used as the delimiter/terminator of each command or message. If any format error occurred, the station would echo a **NAK** message. All these commands are summarized as following table.

1. Data Management Commands

Format	Usage	Return
READ	Read 1 record of data	OVER : buffer is empty <i>Kppyyymmddhhnnabcq...q</i> where, K:"K", identifier of 510 Yymmddhhnn:date & time a:"0" b:working shift (1-4) c:prefix code (0-9) q...q:employee ID
REMOVE	Remove the record just read	NEW :done OVER :buffer empty
CLEAR	Initialize memory	DONE :done
X	on-line stations inquiry	aabb..pp each 2-digitss represent one station ID
TR	System time	yymmddhhnn yy:year hh:hour mm:month nn:minute dd:day ss:second
TWyyymmddhhnn	System time	yy :year hh :hour mm :month nn :minute dd :day ss :second

2. Inquire System Parameter Setting Commands

Format	Usage	Return
G01pp	Line connection	00:reserved, 10:slave 01:stand alone, 11:master
G03pp	On-line printing	0:disable, 1:enable
G12pp	Barcode symbologies	ABCDEF A:Code 39 B:Code 128 C:Interleave 25

		D:Industrial 25 E:Coda-Bar F:UPC/EAN 0:disable, 1:enable
G13pp	Prefix code	0:disable, 1:enable
G14pp	ID code keyboard entry	0:disable, 1:enable
G18pp	Master card	nn.nn , current master card
G19pp	Password	nn.nn , current password
NRppnn	Relay output timetable	Hhmmdd nn:entry number from 01 to 16 hh:starting hour mm:starting minute ddd:duration
DRppnn	Automatic shift change timetable	hhmmxxyyww nn:entry number from 01 to 16 hh:starting hour mm:starting minute xx:end hour yy:end minute w:working shift from 1 to 4
FRpp	ID length	nn :ID length
VRpp	Get current company code	n...n:current company code

3. Program system Parameter Commands

Format	Usage	Parameter
S01ppnn	Line connection	00:reserved, 10:slave 01:stand alone, 11:master
S03ppn	On-line printing	0:disable, 1:enable
S12ppABCDEF	Barcode symbologies	A :Code 39 B :Code 128 C :Interleave 25

		D :Industrial 25 E :Coda-Bar F :UPC/EAN 0:disable, 1:enable
S13ppn	Prefix code	0:disable, 1:enable
S14ppn	ID code keyboard entry	0:disable, 1:enable
S18ppnn..nn	Master card	nn..nn :master card, up to 20 haracters
S19ppnn..nn	Password	nn..nn : password, up to 6 digits
NWppnnhhmmdd	Set relay output timetable	Nn :entry number from 01 to 16 Hh :starting hour Mm :starting minute Ddd :duration
DWppnnhhmmxxyw	Set automatic shift change timetable	Nn :entry number from 01 to 16 hh :starting hour mm :starting minute xx :end hour yy :end minute w :working shift from 1 to 4
FWppnn	ID length	nn :ID length allowed, from 0 to 99
VWppn...n	Set company code	n...n :company code up to 30 characters
Lnpp	Station lock	0:unlock, 1:lock